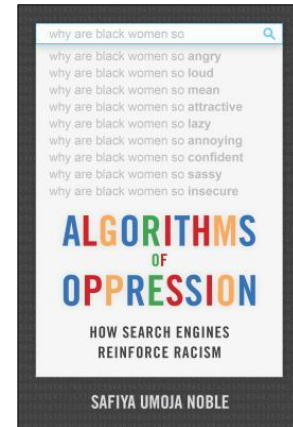Safiya Umoja Noble**, Algorithms of Oppression: How Search Engines Reinforce Racism,** New York, NY: New York University Press, 2018, 256 pp., $28.00 (paperback).

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Hardly a week goes by without news of discrimination or oppression by tech platforms. Tech companies have thoroughly gentrified the Bay Area, causing rampant homelessness and privatizing transportation, all while underpaying workers outside of management. Beyond reshaping our cities and exacerbating class inequality, the tech industry's blindness to race, gender, sexuality, and other forms of identity are now painfully clear, whether its Russia's use of racist tropes to help elect Donald Trump or the ways in which hate groups have flourished on all platforms. As a largely White, cisgender male, straight management class resists embracing cultural differences, platforms are disproportionately censoring queer and feminist interventions while allowing the spread of hate and White supremacy, made most clear by the current president of the United States.

Discrimination in tech was not so clear when Safiya Umoja Noble started writing *Algorithms of Oppression: How Search Engines Reinforce Racism*. In this groundbreaking book, Noble makes a convincing case that how tech companies choose to organize culture matters in very specific ways. Noble's prescient analysis of "algorithmic oppression" toggles back and forth between grand theoretical questions and hyperspecific moments, like searching—"Googling"—"black girls" and "why are black women so," now infamous case studies that inspired the book itself.

In her attention to specificity of experience and its importance to understanding power, Noble writes through and pushes forward a long lineage of intersectional critique that remains undercited in her field despite its deep relevance to contemporary problems. Intersectionality is a theoretical framework developed by Black feminist writers and scholars to describe their marginalization in movements for both racial and gender justice. The response to this "matrix of domination," as Patricia Hill Collins described it, is to account for the specificity of Black women's experiences as related to power. *Algorithms of Oppression* advances critiques of tech platforms for the specific ways in which their blindness to identity causes material forms of oppression in the lives of raced and gendered communities, building on the likes of Anna Everett, Lisa Nakamura, Wendy Chun, Tara McPherson, and André Brock, among others. The book builds on this tradition by integrating political economic analysis and drawing on library, information, and media and communication studies scholars who are critiquing platforms from organizational and technical perspectives like Siva Vaidyanathan and Tartelton Gillespie.

Noble's blending of cultural, technological, and organizational critique highlights the pervasive problem of algorithms as a form of "artificial intelligence," which purports to be neutral despite its development by programmers who are not representative of the communities from which they profit. *Algorithms of Oppression* dismisses any claims that tech is neutral, completely nullifying the argument.

Searching for "black girls," Noble finds pornography that degrades Black women and explicit White supremacist publications calling for the eradication of Black people. In the introduction, Noble searches for "black girls" on her laptop within several feet of her stepdaughter and is horrified she might have done so in front of her.

> Black girls were still the fodder of porn sites, dehumanizing them as commodities, as products and objects of sexual gratification. I closed the laptop and redirected our attention to fun things we might do. . . . This best information, as listed by rank in the search results, was certainly not the best information for me or for the children I love. For whom, then, was this the best information, and who decides? (p. 18)

Noble's book is full of such keen, grounded explications of platform effects, often followed by a series of provocative questions journalists should be asking the leaders of tech companies. Though the book at times seems to raise more questions than it can address, it counteracts our contemporary uncertainty over how these platforms using autoethnography that, in the context of our highly individualized experiences of these platforms, securely buttresses her claim that these dynamics are systemic. To dismiss claims that the above anecdote was a "fluke," Noble then conducts searches for "white girls," "american indian girls," "asian girls" and "latina girls," all of which turn up problematic results by turns misogynistic, racist, or otherwise unhelpful to democratic discourse. There are additional cases highlighting different results for searching "three black teenagers" versus "three white teenagers," or cases where the search of "unprofessional hairstyles" yields almost all people of color than "professional hairstyles," which yields only blonde hair. This cunning investigative and authoethnographic work shows undeniably how much algorithmically based platforms are reliant on broader cultural power dynamics: "Google's dominant narratives reflect the kinds of hegemonic frameworks and notions that are often resisted by women and people of color" (p. 14).

The book goes beyond autoethnography, though, delving deep into a diverse range of case studies about the myriad ways search is harming our world, including Europe's debate over the right to be forgotten; the case of Dylann Roof, who killed nine Black parishioners at Emanuel African Methodist Episcopal Church; the terrible working conditions and political ramifications of raw mineral extraction in Africa; and even the ways in which universities do not require classes on social or cultural analysis, let alone intersectionality, for engineering and computer science students. On the right to be forgotten, Noble shows how Google exposes criminal records kept disproportionately about people of color and therefore participates deepening labor inequality. On Roof, she notes how it was searching for "black on white crime" that motivated the shooter to attack a Black church with a civil rights legacy, despite ample evidence that crime is intraracial far more than interracial. Both of these case studies are vexing problems, and yet Noble remarkably peppers her book with concrete solutions. On Google's recriminalization of Black people, she suggests that "we need to think about delisting or even deprioritizing particular types of representative records" (p. 124), while earlier noting the historical relationship between classification, record-keeping, racism, and slavery. On Roof, she succinctly identifies the problem: "Search results belie any ability to intercede in the framing of a question itself. . . . They oversimplify complex phenomena. They obscure any struggle over understanding, and they can mask history" (p. 116).

Algorithms of Oppression is an elegantly rigorous work. All of Noble's case studies are backed by citations of studies from scholars across fields from sociology to information studies. (In a nice style gesture, she lists every cited scholar's full name and affiliation, as a way of modeling the attention to fact, detail, and context that she asks of search engines.) These studies are thoroughly explained and engaged with theory, often supplemented with historical context or close readings of contemporary policy debates.

Refreshingly, Noble concludes the book with concrete policy advice, explicating the ways in which the Internet is already regulated and advocating for more. "I am trying to make the case, through mounting evidence, that unregulated digital platforms cause harm" (p. 166). Early on, Noble suggests we consider antitrust action on the few tech companies that own and manage the platforms the vast majority of Americans and large pluralities of the world use. The book mounts the evidence for what she calls a "Black feminist technology studies" approach (p. 174). Ultimately, she advocates for noncommercial, transparent search that is accountable to the public at large, and she outlines the vision very specifically, even diagrammatically:

> Imagine instead that all of our results were delivered in a visual rainbow of color that symbolized a controlled set of categories such that everything on the screen that was red was pornographic, everything that was green was business or commerce related, everything orange was entertainment, and so forth. (p. 180)

Here she opens space for us to imagine how to "denaturalize and reconceptualize how information could be provided to the public" (p. 180).

We desperately need to imagine a new culture of information, and Noble gives us all the evidence we need to start making dreams of equitable tech into reality. No book is perfect, and indeed Noble's book sometimes reads as if the author is raising more questions than the book can handle or is still thinking through very recent events. But, as she points out, this is a natural byproduct of writing about contemporary phenomena without the benefit of hindsight.

Algorithms of Oppression will stand the test of time for significantly pushing forward our conversation about the cultural effects of tech and artificial intelligence, shining a light on the importance of an intersectional framework to understanding and combating the complex, contextual problems these platforms reveal.